

## **Claims**

1. A distributed matrix wiring assembly for connecting a routing relay module to a payload equipment device over a first set of harness wires having first and second ends, said routing relay module being adapted to provide a plurality of driving signals to said set of harness wires at the first end, said payload equipment device having an overall matrix node requirement, said assembly comprising:
  - (a) a distributed matrix module coupled to said first set of harness wires at the second end and coupled to said payload equipment device, said distributed matrix module including:
    - (i) at least one distributed matrix column wire;
    - (ii) at least one distributed matrix row wire;
    - (iii) said distributed matrix column and row wires being configured to form a distributed matrix having distributed matrix nodes, each distributed matrix node being defined by the unique combination of a distributed matrix column wire and a distributed matrix row wire;
  - (b) such that the distributed matrix nodes form at least a portion of the overall matrix node requirement.
2. The assembly of claim 1, wherein the combined number of distributed column and row matrix wires is at least three.
3. The assembly of claim 1, wherein the payload equipment device includes an element selected from the group consisting of switch, relay, actuator, sensor, indicator, a device requiring command signals, a device generating telemetry feedback.
4. The assembly of claim 1, wherein the payload equipment device includes circuitry and wherein the distributed matrix module is adapted to be integrated within the payload equipment device such that said distributed

matrix column and row wires are connected at said distributed matrix nodes through said circuitry.

5. The assembly of claim 1, wherein the distributed matrix module is adapted to be separate from the payload equipment device.
6. The assembly of claim 5, wherein the distributed matrix column and row wires are coupled to the payload equipment device over a second set of harness wires.
7. The assembly of claim 1, wherein the number of distributed matrix nodes equals the overall matrix node requirement of the payload equipment device.
8. The assembly of claim 1, wherein the number of distributed matrix nodes is less than the overall matrix node requirement of the payload equipment device.
9. The assembly of claim 1, wherein the distributed matrix also contains at least one distributed matrix level wire such that each distributed matrix node is defined by the unique combination of a distributed matrix column wire, a distributed matrix row wire and a distributed matrix level wire.